INSTRUCTION MANUAL

SIL 2 - SC 3 Repeater Power Supply / Analog Signal Converter and Trip Amplifiers, DIN-Rail & Termination Board, Model D5254S

gmi technology for safety

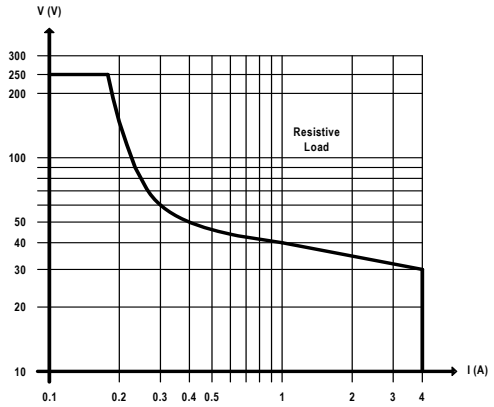
Characteristics

General Description: the single channel Power Supply Repeater and Trip Amplifier D5254S provides a fully floating dc supply to energize conventional 2 wires 4-20 mA transmitters located in Hazardous Area; it also accepts 0/4-20 mA current input signals, as well as ±12 V voltage inputs (also suitable for 0/1-5 V and 0/2-10 V signals) from Hazardous Area.
The module repeats/converts (in linear or square root scale) the input as on current signal, in a floating circuit to drive a Safe Area load, suitable for applications requiring SIL 2 (according to IEC 61508:2010) in safety related systems for high risk industries. The output signal can be in direct or reverse form.
Two independent Alarm Trip Amplifiers are also provided. Each alarm energizes or de-energizes an SPDT relay for low, high, window or fault repeater alarm functions.
The two alarm relays trip points are settable over the entire input signal range. An optional alarm acknowledgement input is also provided.
Function: 1 I.S. channel analog input for 2 wires loop powered or separately powered Smart transmitters or Current or Voltage signals, provides 3 port isolation (input/output/supply) and current (source or sink mode) output signal. In addition, it provides two SPDT relay alarm contacts with adjustable alarm trip point.
The out-of-range (burnout) fault is repeated to the bus.
Configurability: totally software configurable (no jumpers or switches), by PC via USB with PPC5092 Adapter and related configurator software or by RS485 Modbus output, in order to choose: mA or V input signal, linear or reverse output signal, alarm trip point, low, high, window or fault repeater alarm mode, hysteresis, delay time.
Functional Safety Management Certification:
G.M. International is certified by TUV to conform to IEC61508:2010 part 1 clauses 5-6 for safety related systems up to and included SIL3.

Technical Data

Supply: 24 Vdc nom (21.5 to 30 Vdc) reverse polarity protected, ripple within voltage limits ≤ 5 Vpp, 2 A time lag fuse internally protected.
Current consumption @ 24 V: 110 mA max. with 20 mA input/output and alarm relays energized.
Power dissipation: 2.3 W max. at 24 V supply, 20 mA input/output and alarm relays energized.
Isolation (Test Voltage): I.S. Input / all Outputs 1.5 KV; I.S. Input / Supply 1.5 KV; I.S. Input / Ack 1.5 KV; Analog Output / Alarm Outputs 1.5 KV; Analog Output / Supply 500 V; Analog Output / Ack 500 V; Alarm Outputs / Supply 1.5 KV; Supply / Ack 500 V, Alarm Output / AlarmOutput 1.5 KV.
Input: 0/4 to 20 mA (separately powered input, voltage drop ≤ 0.5 V) or 4 to 20 mA (2 wires Tx current limited at ≈ 25 mA), or voltage input ±12 V.
Integration time: 100 ms. ***Input range :*** 0 / +25 mA for current, ± 12 V for voltage.
Resolution / Visualization: 1 µA for current; 1 mV (±12 V range).
Transmitter line voltage: 15.5 V typical at 20 mA with max. 20 mV ripple, 15.0 V minimum.
Acknowledgement Input: logic level reverse polarity protected.
Trip voltage levels: OFF status ≤ 5.0 V, ON status ≥ 18.0 V (maximum 30 V).
Current consumption @ 24 V: 10 mA max.
Fault: Out-of-range (burnout) fault detection can be enabled or disabled. Analog output can be programmed to detect fault condition with downscale or highscale forcing. Alarms can be programmed to detect fault condition. Fault conditions are also signalled via Power Bus or Termination Board and by a red LED on the front panel.
Out- of-range: low and high separated trip point values are fully programmable.
Analog Output: Fully customizable 0/4 to 20 mA, on max. 300 Ω load source mode, current limited at 25 mA.
In sink mode, external voltage generator range is V min. 3.5 V at 0 Ω load and V max. 30 V. If generator voltage Vg > 10 V, a series resistance ≥ (Vg - 10)/0.024 Ω is needed. The maximum value of series resistance is (Vg - 3.5)/0.024 Ω.
Resolution: 1 µA. ***Transfer characteristic:*** linear or reverse.
Response time: ≤ 100 ms (10 to 90% step change).
Output ripple: ≤ 20 mVrms on 250 Ω.
Alarm: ***Trip point range:*** within rated limits of input sensor.
ON-OFF delay time: 0 to 1000 s, 100 ms step, separate setting.
Hysteresis: programmable over full measuring range.
Output: voltage free SPDT relay contacts (NO and NC).
Contact material: Ag Alloy (Cd free) or $AgSnO_2$.
Contact rating: 4 A 250 Vac 1000 VA, 4 A 250 Vdc 120 W (resistive load).
Mechanical / Electrical life: $5 * 10^6$ / $3 * 10^4$ operation, typical.
Bounce time NO / NC contact: 3 / 8 ms, typical.
Frequency response: 10 Hz maximum.
Modbus Output: for parameter configuration and fault indication. Modbus RTU protocol up to 115.2 Kbit/s with RS-485 connection on Power Bus connector.
Transmission cable length: ≤ 1000 m up to 115.2 Kbit/s.
Performance: Ref. Conditions 24 V supply, 250 Ω load, 23 ± 1 °C ambient temperature.
Input: *Calibration and linearity accuracy:* ≤ ± 10 µA for current;
≤ ± 5 mV (0-10 V range), for voltage.
Temperature influence: ≤ ± 0.005 % of input range for a 1°C change for current and voltage signals.
Analog: *Calibration accuracy:* ≤ ± 0.05 % of full scale;
Output *Linearity error:* ≤ ± 0.05 % of full scale;
Supply voltage influence: ≤ ± 0.02% of full scale for min to max supply change;
Load influence: ≤ ± 0.02% of full scale for a 0 to 100% load resistance change;
Temperature influence: ≤ 0.005% of output range for a 1°C change.

DC Load breaking capacity:



Compatibility:
CE mark compliant, conforms to Directives:
2014/34/EU ATEX, 2014/30/EU EMC, 2014/35/EU LVD, 2011/65/EU RoHS.
Environmental conditions:
Operating: temperature limits – 40 to + 70 °C, relative humidity 95 %, up to 55 °C.
Max altitude: 2000 m a.s.l.
Storage: temperature limits - 45 to + 80 °C.
Safety Description:
ATEX: II 3(1)G Ex ec nC [ia Ga] IIC T4 Gc, II (1)D [Ex ia Da] IIIC, I (M1) [Ex ia Ma] I; ***IECEx:*** Ex ec nC [ia Ga] IIC T4 Gc, [Ex ia Da] IIIC, [Ex ia Ma] I,
UL: NI / I / 2 / ABCD / T4, AIS / I, II, III / 1 / ABCDEFG, [AEx ia Ga] IIC; ***C-UL:*** NI / I / 2 / ABCD / T4, AIS / I, II, III / 1 / ABCDEFG, [Ex ia Ga] IIC
EAC-EX: 2Ex ec nC [ia Ga] IIC T4 Gc X; [Ex ia Da] IIIC X; [Ex ia Ma] I X.
CCC: Ex ec nC [ia Ga] IIC T4 Gc; [Ex ia Ga] IIC; [Ex ia Da] IIIC
associated apparatus and non-sparking electrical equipment.
Uo/Voc = 26 V, Io/Isc = 91 mA, Po/Po = 588 mW at terminals 13-14
Uo/Voc = 1.1 V, Io/Isc = 56 mA, Po/Po = 16 mW at terminals 14-16
Uo/Voc = 1.1 V, Io/Isc = 0.012 mA, Po/Po = 0.004 mW at terminals 15-16
Ui/Vmax = 30 V at terminals 14-16 or 15-16, Ii/Imax = 128 mA at terminals 14-16, Ci = 2.1 nF, Li = 0 nH at terminals 13-14-15-16.
Um = 250 Vrms, -40 °C ≤ Ta ≤ 70 °C.
Approvals:
BVS 16 ATEX E 066 X conforms to EN60079-0, EN60079-7, EN60079-11, EN60079-15. IECEx BVS 16.0043X conforms to IEC60079-0, IEC60079-7, IEC60079-11, IEC60079-15.
UL & C-UL E222308 conforms to UL 61010-1, UL913, UL 60079-0, UL60079-11, UL121201 for UL
and CAN/CSA C22.2 No. 61010-1-12, CSA-E60079-0, CSA-E60079-11, CSA-C22.2 No. 213 for C-UL.
EAЭC RU C-IT.AA87.B.01310/24 conforms to GOST 31610.0, GOST 31610.7, GOST 31610.11, GOST 31610.15.
CCC n. 2020322316000978 conforms to GB/T 3836.1, GB/T 3836.3, GB/T 3834.4, GB/T 3836.8
DNV Type Approval Certificate No. TAA00001U0 and KR No.MIL20769-EL002 Certificates for maritime applications.
TÜV Certificate No. C-IS-722160171, SIL 2 conforms to IEC61508:2010 Ed.2 .
SIL 3 Functional Safety TUV Certificate conforms to IEC61508:2010 Ed.2, for Management of Functional Safety.
Mounting: EN/IEC60715 TH 35 DIN-Rail, with or without Power Bus or on customized Termination Board.
Connection: by polarized plug-in disconnect screw terminal blocks to accommodate terminations up to 2.5 mm^2.
Location: installation in Safe Area/Non Hazardous Locations or Zone 2, Group IIC T4 or Class I, Division 2, Group A,B,C,D, T4.
Protection class: IP 20.
Weight: about 120 g.
Dimensions: Width 22.5 mm, Depth 123 mm, Height 120 mm.

Programming

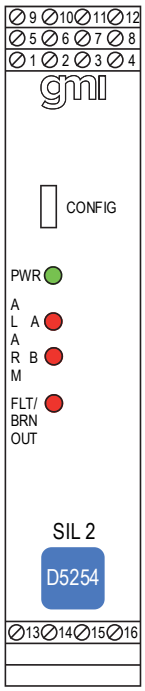
The module is fully programmable. Operating parameters can be changed from PC via PPC5092 adapter connected to USB serial line and SWC5090 software.
Measured values and diagnostic alarms can be read on both serial configuration or Modbus output line.
SWC5090 software also allows the Monitoring and Recording of values. For details please see SWC5090 manual ISM0154.

Ordering Information

Model:	D5254	
1 channel		S

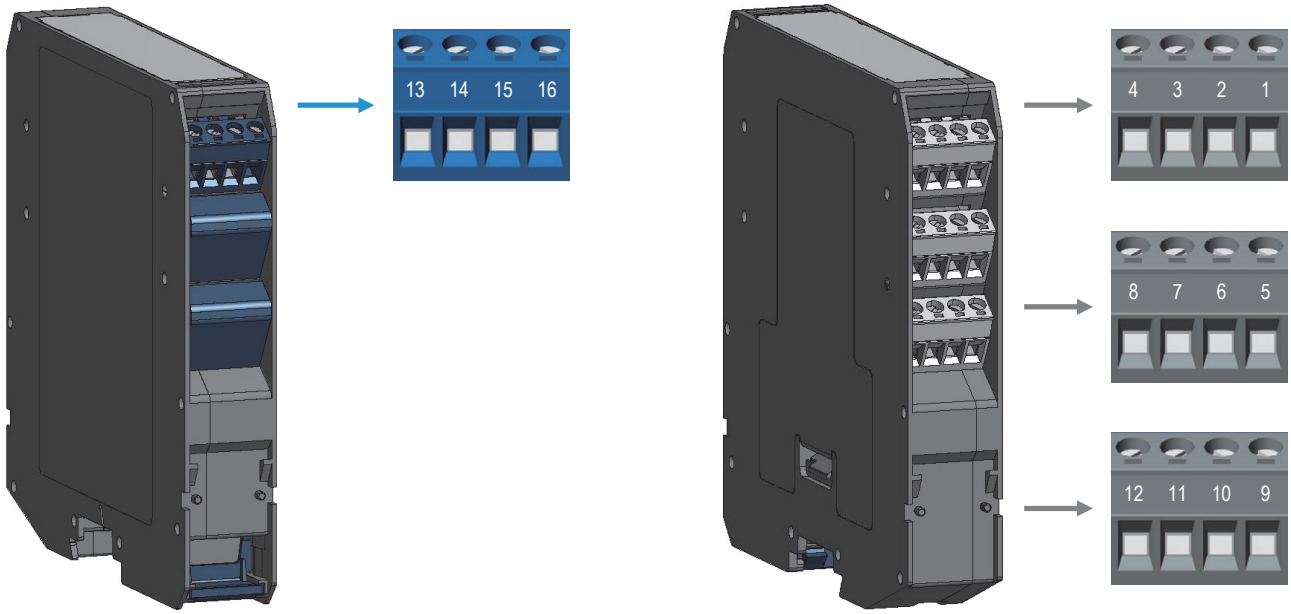
Power Bus and DIN-Rail accessories:
Connector JDFT050 — Cover and fix MCHP196
Terminal block male MOR017 — Terminal block female MOR022

Front Panel and Features



- SIL 2 according to IEC 61508:2010 (Route 2H) with Tproof = 10 / 20 years (≤10% / >10 % of total SIF), PFDavg(1year) 9.38E-05, DC 88.58%, SFF 93.56% for input current & analog current source/sink output.
- SIL 2 according to IEC 61508:2010 (Route 2H) with Tproof = 5 / 20 years (≤10% / >10 % of total SIF), PFDavg(1year) 1.87E-04, DC 70.96%, SFF 87.46% for input current & single alarm trip amplifier with relay output.
- SIL 2 according to IEC 61508:2010 (Route 2H) with Tproof = 20 years (≤10% of total SIF), PFDavg(1year) 4.87E-05, DC 90.47%, SFF 96.06% for input current & 1oo2 architecture of alarm trip amplifiers with relay outputs.
- SC 3: Systematic Capability SIL 3.
- Input from Zone 0 (Zone 20), installation in Zone 2.
- Current Input signal: 4-20 mA loop or 0/4-20 mA externally powered. Voltage Input signal: ±12 V.
- Source/Sink Current Output signal: 0/4-20 mA linear or reverse.
- Input and Output short circuit protection.
- Modbus RTU RS-485 Output.
- Out-of-range (burnout) fault detection.
- High Accuracy, µP controlled A/D converter.
- Three port isolation, Input / Output / Supply.
- EMC Compatibility to EN61000-6-2, EN61000-6-4, EN61326-1, EN61326-3-1 for safety systems.
- ATEX, IECEx, UL & C-UL, EAC-EX, CCC, TÜV Certifications.
- Type Approval Certificate DNV and KR for maritime applications.
- TÜV Functional Safety Certification.
- Fully programmable operating parameters.
- High Density: 1 channel, 2 trips with alarm relays.
- Optional alarm acknowledgement input.
- Simplified installation using standard DIN-Rail and plug-in terminal blocks, with or without power Bus, or customized Termination Boards.

Terminal block connections



HAZARDOUS AREA

13	+ Input for 2 Wire Transmitters
14	- Input for 2 Wire Transmitters or + Input for External Powered Transmitters
15	+ Input for V signal
16	- Input for External Powered Transmitters or - Input for V signal

SAFE AREA

1	+ Output Ch 1
2	- Output Ch 1
3	+ Output Ch 2
4	- Output Ch 2
5	+ Output Ch 3
6	- Output Ch 3
7	+ Output Ch 4
8	- Output Ch 4
9	+ Power Supply 24 Vdc
10	- Power Supply 24 Vdc
11	Alarm out
12	Alarm out

Parameters Table

In the system safety analysis, always check the Hazardous Area/Hazardous Locations devices to conform with the related system documentation, if the device is Intrinsically Safe check its suitability for the Hazardous Area/Hazardous Locations and group encountered and that its maximum allowable voltage, current, power (Ui/Vmax, Ii/Imax, Pi/Pi) are not exceeded by the safety parameters (Uo/Voc, Io/Isc, Po/Po) of the D5254 Associated Apparatus connected to it. Also consider the maximum operating temperature of the field device, check that added connecting cable and field device capacitance and inductance do not exceed the limits (Co/Ca, Lo/La, Lo/Ro) given in the Associated Apparatus parameters for the effective group. See parameters indicated in the table below:

D5254 Terminals	D5254 Associated Apparatus Parameters		Must be	Hazardous Area/ Hazardous Locations Device Parameters
13-14	Uo / Voc = 26 V		≤	Ui / Vmax
14-16	Uo / Voc = 1.1 V			
15-16	Uo / Voc = 1.1 V			
13-14	Io / Isc = 91 mA		≤	Ii/ Imax
14-16	Io / Isc = 56 mA			
15-16	Io / Isc = 0.012 mA			
13-14	Po / Po = 588 mW		≤	Pi / Pi
14-16	Po / Po = 16 mW			
15-16	Po / Po = 0.004 mW			
D5254 Terminals	**D5254 Associated Apparatus Parameters Cenelec (US)**		**Must be**	**Hazardous Area/ Hazardous Locations Device + Cable Parameters**
13-14	IIC IIB IIA I IIIC	Co / Ca = 0.096 µF Co / Ca = 0.767 µF Co / Ca = 2.597 µF Co / Ca = 4.497 µF Co / Ca = 0.767 µF	≥	Ci / Ci device + C cable
14-16	IIC / IIB / IIA I / IIIC	[1])		
15-16	IIC / IIB / IIA I / IIIC	[1])		
13-14	IIC IIB IIA I IIIC	Lo / La = 4.34 mH Lo / La = 17.36 mH Lo / La = 34.72 mH Lo / La = 56.96 mH Lo / La = 17.36 mH	≥	Li / Li device + L cable
14-16	IIC / IIB / IIA I / IIIC	[1])		
15-16	IIC / IIB / IIA I / IIIC	[1])		
13-14	IIC IIB IIA I IIIC	N.A. Lo / Ro = 242.2 µH/Ω Lo / Ro = 484.4 µH/Ω Lo / Ro = 794.7 µH/Ω Lo / Ro = 242.2 µH/Ω	≥	Li / Ri device and L cable / R cable
14-16	IIC / IIB / IIA I / IIIC	[1])		
15-16	IIC / IIB / IIA I / IIIC	[1])		

[1]) Co, Lo and Lo/Ro parameters are determined by maximum allowed parameters of field device.

When used with separate powered intrinsically safe devices, check that maximum allowable voltage, current (Ui/Vmax, Ii/Imax) of the D5254 Associated Apparatus are not exceeded by the safety parameters (Uo/Voc, Io/Isc) of the Intrinsically Safe device, indicated in the table below:

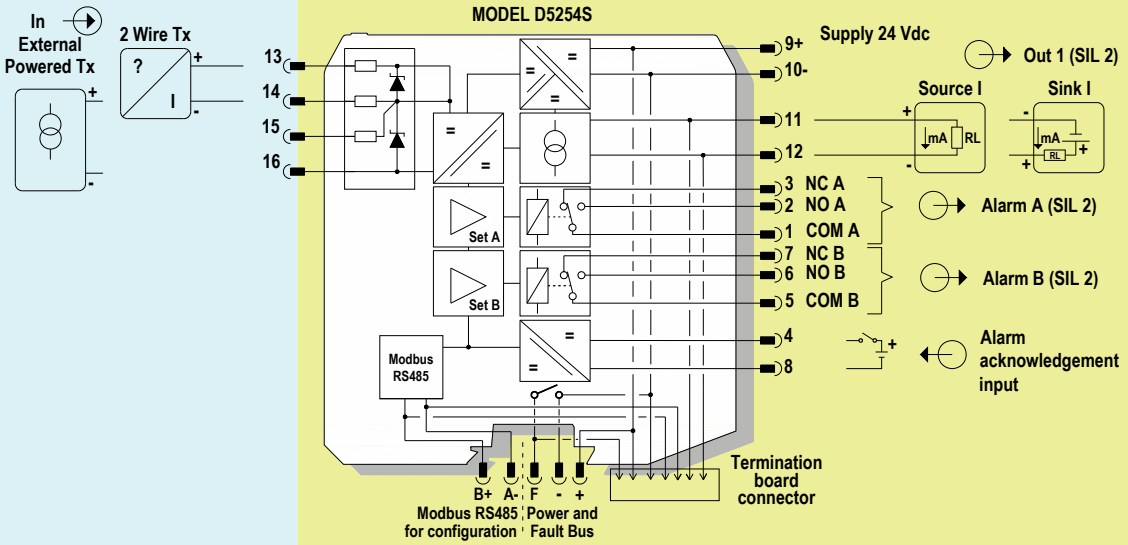
D5254 Terminals	D5254 Associated Apparatus Parameters	Must be	Hazardous Area/ Hazardous Locations Device Parameters
14-16; 15-16	Ui / Vmax = 30 V	≥	Uo / Voc
14-16	Ii / Imax = 128 mA	≥	Io / Isc
14-16; 15-16	Ci = 2.1 nF, Li= 0 nH		

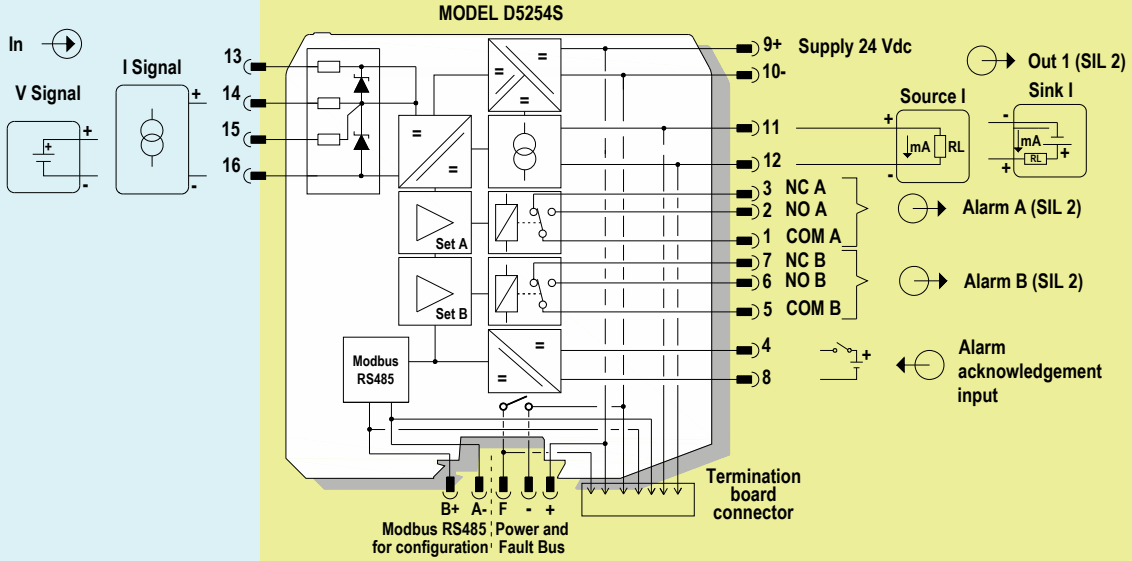
For installations in which both the Ci and Li of the Intrinsically Safe apparatus exceed 1% of the Co and Lo parameters of the Associated Apparatus (excluding the cable), then 50% of Co and Lo parameters are applicable and shall not be exceeded (50% of the Co and Lo become the limits which must include the cable such that Ci device + C cable ≤ 50 % of Co and Li device + L cable ≤ 50 % of Lo). The reduced capacitance of the external circuit (including cable) shall not be greater than 1 µF for Groups I, IIA, IIB and 600 nF for Group IIC. If the cable parameters are unknown, the following value may be used: Capacitance 200 pF per meter (60 pF per foot), Inductance 1 µH per meter (0.20 µH per foot).

Function Diagram

HAZARDOUS AREA ZONE 0 (ZONE 20) GROUP IIC,
HAZARDOUS LOCATIONS CLASS I, DIVISION 1, GROUPS A, B, C, D,
CLASS II, DIVISION 1, GROUPS E, F, G, CLASS III, DIVISION 1,
CLASS I, ZONE 0, GROUP IIC

SAFE AREA, ZONE 2 GROUP IIC T4,
NON HAZARDOUS LOCATIONS, CLASS I, DIVISION 2,
GROUPS A, B, C, D T-Code T4





Relay contacts shown in de-energized position.
Terminals: 1-2 and 5-6 are open; 1-3 and 5-7 are closed.

Warning

D5254 series is isolated Intrinsically Safe Associated Apparatus installed into standard EN/IEC60715 TH 35 DIN-Rail located in Safe Area/Non Hazardous Locations or Zone 2, Group IIC T4 or Class I, Division 2, Group A, B, C, D, T4 Hazardous Area within the specified operating temperature limits Tamb –40 to +70 °C, and connected to equipment with a maximum limit for power supply Um of 250 Vrms or Vdc. Not to be connected to control equipment that uses or generates more than 250 Vrms or Vdc with respect to earth ground.
D5254 series must be installed, operated and maintained only by qualified personnel, in accordance to the relevant national/international installation standards (e.g. IEC/EN60079-14 Electrical apparatus for explosive gas atmospheres - Part 14: Electrical installations in hazardous areas (other than mines)), following the established installation rules, particular care shall be given to segregation and clear identification of I.S. conductors from non I.S. ones.
De-energize power source (turn off power supply voltage) before plug or unplug the terminal blocks when installed in Hazardous Area or unless area is known to be nonhazardous.
Warning: substitution of components may impair Intrinsic Safety and suitability for Zone 2/Division 2. Avertissement: la substitution des composants peut nuire à la sécurité intrinsèque et à l'aptitude à la Zone 2/Div. 2.
Explosion Hazard: to prevent ignition of flammable atmospheres, disconnect power before servicing or unless area is known to be nonhazardous. Danger d'Explosion: pour éviter l'inflammation d'atmosphères inflammables, débrancher l'alimentation avant l'entretien ou à moins que région est connue pour être non dangereuse.
Warning: de-energize main power source (turn off power supply voltage) and disconnect plug-in terminal blocks before opening the enclosure to avoid electrical shock when connected to live hazardous potential. Avertissement: débrancher l'alimentation (couper la tension d'alimentation) et les blocs de jonction enfichables avant d'ouvrir le boîtier pour éviter les chocs électriques lorsqu'ils sont connectés à un potentiel dangereux.
Failure to properly installation or use of the equipment may risk to damage the unit or severe personal injury. The unit cannot be repaired by the end user and must be returned to the manufacturer or his authorized representative. Any unauthorized modification must be avoided.

Operation

The single channel Power Supply Repeater and Trip Amplifier D5254S provides a fully floating dc supply to energize conventional 2 wires 4-20 mA transmitters located in Hazardous Area; it also accepts 0/4-20 mA current input signals, as well as ±12 V voltage inputs (also suitable for 0/1-5 V and 0/2-10 V signals) from Hazardous Area. The module repeats/converts (in linear or square root scale) the input as on current signal, in a floating circuit to drive a Safe Area load, suitable for applications requiring SIL 2 (according to IEC 61508:2010) in safety related systems for high risk industries. The output signal can be in direct or reverse form.
Two independent Alarm Trip Amplifiers are also provided. Each alarm energizes or de-energizes an SPDT relay for low, high, window or fault repeater alarm functions.
The two alarm relays trip points are settable over the entire input signal range. Out-of-range (burnout) fault detection can be enabled or disabled.
An optional alarm acknowledgement input is also provided.
Presence of supply power is displayed by a "POWER ON" green signaling LED; Alarm A, Alarm B and Burnout condition are signaled by related red front panel fault LED.

Installation

D5254 series is a repeater power supply with trip amplifiers housed in a plastic enclosure suitable for installation on EN/IEC60715 TH 35 DIN-Rail, with or without Power Bus or on customized Termination Board.
D5254 series can be mounted with any orientation over the entire ambient temperature range.
Electrical connection are accommodated by polarized plug-in removable screw terminal blocks which can be plugged in/out into a powered unit without suffering or causing any damage **(for Zone 2 installations check the area to be nonhazardous before servicing)**. Connect only one individual conductor per each clamping point, use conductors up to 2.5 mm² (13 AWG) and a torque value of 0.5-0.6 Nm. For USA and Canada installations, use only cables that are suitable for a temperature of at least 85°C. The wiring cables have to be proportionate in base to the current and the length of the cable.
On the section "Function Diagram" and enclosure side a block diagram identifies all connections.
Identify the function and location of each connection terminal using the wiring diagram on the corresponding section,
as an example (source current output, both trip amplifier outputs of alarms):
Connect 24 Vdc power supply positive at terminal "9" and negative at terminal "10".
Connect positive output of analog channel at terminal "11" and negative output at "12".
Connect trip amplifier output of alarm 1 at terminal "1" - "3" (for Normally Open NO contact) or "1" - "2" (for Normally Closed NC contact).
Connect trip amplifier output of alarm 2 at terminal "5" - "6" (for Normally Open NO contact) or "5" - "4" (for Normally Closed NC contact).
In case of a 2 wire input transmitter, connect the wires at terminal "13" for positive and "14" for negative.
For separately powered transmitters, connect input signal at terminal "14" for positive and "16" for negative..

Intrinsically Safe conductors must be identified and segregated from non I.S. and wired in accordance to the relevant national/international installation standards (e.g. EN/IEC60079-14 Electrical apparatus for explosive gas atmospheres - Part 14: Electrical installations in hazardous areas (other than mines)), make sure that conductors are well isolated from each other and do not produce any unintentional connection.
Connect alarm contacts checking the load rating to be within the contact maximum rating 4 A 250 Vac 1000 VA, 4 A 250 Vdc 120 W (resistive load).
To prevent alarm relay contacts from damaging, connect an external protection (fuse or similar), chosen according to the relay breaking capacity diagram from installation instructions.
The enclosure provides, according to EN60529, an IP20 minimum degree of protection (or similar to NEMA Standard 250 type 1). The equipment shall only be used in an area of at least pollution degree 2, as defined in IEC 60664-1. When installed in EU Zone 2, the unit shall be installed in an enclosure that provides a minimum ingress protection of IP54 in accordance with IEC 60079-0. When installed in a Class I, Division 2 Hazardous Location, the unit shall be mounted in a supplemental enclosure that provides a degree of protection not less than IP54. The enclosure must have a door or cover accessible only by the use of a tool. The end user is responsible to ensure that the operating temperature of the module is not exceeded in the end use application.
Units must be protected against dirt, dust, extreme mechanical (e.g. vibration, impact and shock) and thermal stress, and casual contacts. If enclosure needs to be cleaned use only a cloth lightly moistened by a mixture of detergent in water.
Electrostatic Hazard: to avoid electrostatic hazard, the enclosure of D5254 series must be cleaned only with a damp or antistatic cloth.
Any penetration of cleaning liquid must be avoided to prevent damage to the unit. Any unauthorized card modification must be avoided.
D5254 series must be connected to SELV or PELV supplies.
All circuits connected to D5254 series must comply with the overvoltage category II (or better) according to EN/IEC60664-1.
Warning: de-energize main power source (turn off power supply voltage) and disconnect plug-in terminal blocks before opening the enclosure to avoid electrical shock when connected to live hazardous potential.

Start-up

Before powering the unit check that all wires are properly connected, particularly supply conductors and their polarity, input and output wires, also check that Intrinsically Safe conductors and cable trays are segregated (no direct contacts with other non I.S. conductors) and identified either by color coding, preferably blue, or by marking.
Check conductors for exposed wires that could touch each other causing dangerous unwanted shorts.
Check that the module has been correctly configured through SWC5090 software. For details please see SWC5090 manual ISM0154.
Turn on power, the "power on" green led must be lit, for 2 wire transmitter connection the supply voltage on each channel must be ≥ 15 V, output signal should be corresponding to the input from the transmitter, alarm LED should reflect the input variable condition with respect to trip points setting.
If possible change the transmitter output and check the corresponding Safe Area output.

Configuration parameters:

INPUT:

Input Type:

☐ current (for SIL applications)

☐ voltage

Range:

☐ 0/4-20 mA represents the allowed input current ranges (only 4-20 mA range for SIL applications)

☐ ± 12 V represents the allowed input voltage ranges

Input conversion: (for SIL applications)

☐ Linear the module repeats in linear scale the input to the output

☐ Square root the module converts in square root scale the input to output

Out of range: (for SIL applications: Low threshold ≤ Under Range < 4 mA and High threshold ≥ Over Range > 20 mA)

☐ Low threshold input value below which the fault is triggered

☐ High threshold input value above which the fault is triggered

Tag:

16 alphanumerical characters

OUTPUT

Type:

☐ 0-20 mA Sink

☐ 4-20 mA Sink (for SIL applications)

☐ Custom Sink all Output parameters are fully customizable

☐ 0-20 mA Source

☐ 4-20 mA Source (for SIL applications)

☐ Custom Source all Output parameters are fully customizable

Downscale (only 4 mA value for SIL applications)

analog output downscale in normal working condition (range 0 to 24 mA)

Upscale (only 20 mA value for SIL applications)

analog output upscale in normal working condition (range 0 to 24 mA)

Under range (value < 4 mA for SIL applications)

analog output value in under range condition (range 0 to 24 mA)

Over range (value > 20 mA for SIL applications)

analog output value in over range condition (range 0 to 24 mA)

Fault Output Value (for SIL applications: value ≤ Under Range < 4 mA or value ≥ Over Range > 20 mA)

analog output value in case of fault condition (range 0 to 24 mA)

Fault in case of (for SIL applications)

analog output is forced to "Fault Output Value" when input is out of configured range

ALARM

Type: (for SIL applications)

☐ None alarm is disabled

☐ Low alarm is triggered when input descends below "Low Set"

☐ High alarm is triggered when input ascends above "High Set"

☐ Window alarm is triggered below "Low Set" and above "High Set"

Alarm Lock:

alarm is inhibited until source ascends above or descends below the configuration parameters, and then, it behaves as standard configuration.

NO contact position in case of alarm:

☐ Open alarm output is closed under regular working conditions, and it opens in case of alarm (for SIL applications)

☐ Closed alarm output is open under regular working conditions, and it closes in case of alarm

Low Set: (only value in the range 4 to 20 mA for SIL applications)

input value below which the alarm is triggered (in Low, Window)

Low Hysteresis: (only value ≤ (20 mA - Low Set) for SIL applications)

hysteresis on the low set value

High Set: (only value in the range 4 to 20 mA for SIL applications)

Input value above which the alarm is triggered (in High, Window)

High Hysteresis: (only value ≤ (High Set - 4 mA) for SIL applications)

hysteresis on the high set value

On Delay (for SIL applications, in accordance with SIF requirements)

time for which the input has to be in alarm condition before the alarm output is triggered; configurable from 0 to 1000 seconds in steps of 100 ms.

Off Delay (for SIL applications, in accordance with SIF requirements)

time for which the input has to be in normal condition before the alarm output is deactivated; configurable from 0 to 1000 seconds in steps of 100 ms.

FAULT

Alarm is triggered when input is out of configured range

In case of fault:

☐ Ignore alarm is affected

☐ Lock status remains in the same status as it was before Fault occurred

☐ Alarm active alarm is triggered (for SIL applications)

☐ Alarm inactive alarm is deactivated

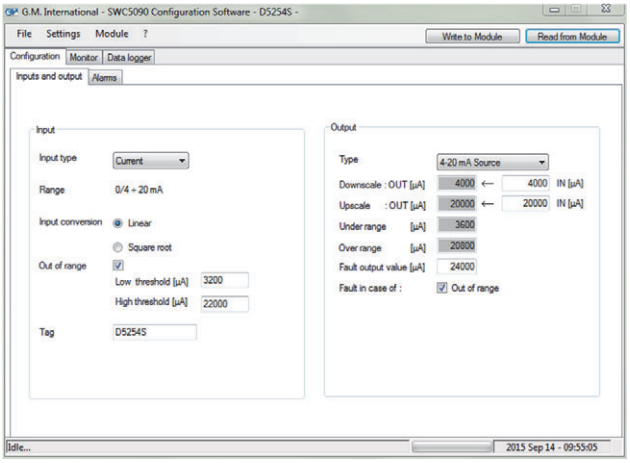
Alarm acknowledgement: (it doesn't affect SIL applications)

☐ Ignore alarm is automatically reset

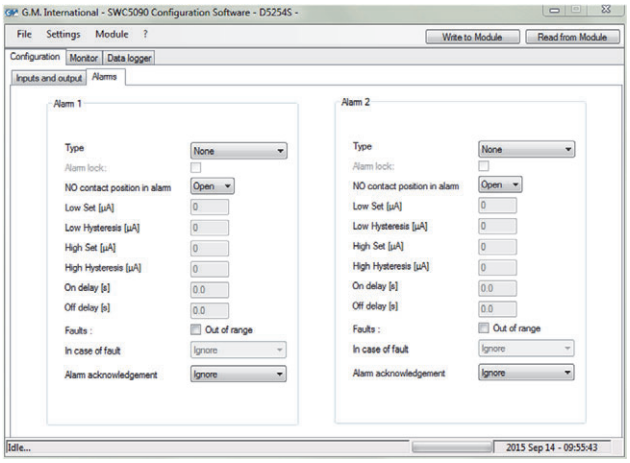
☐ Active high a voltage source of 24 Vdc must be applied, at the relative terminals, to reset alarm

☐ Alarm active a voltage source of 0 Vdc must be applied, at the relative terminals, to reset the alarm

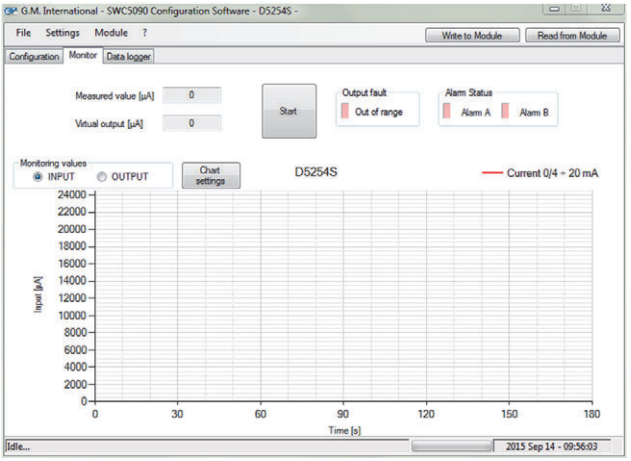
Screenshots:



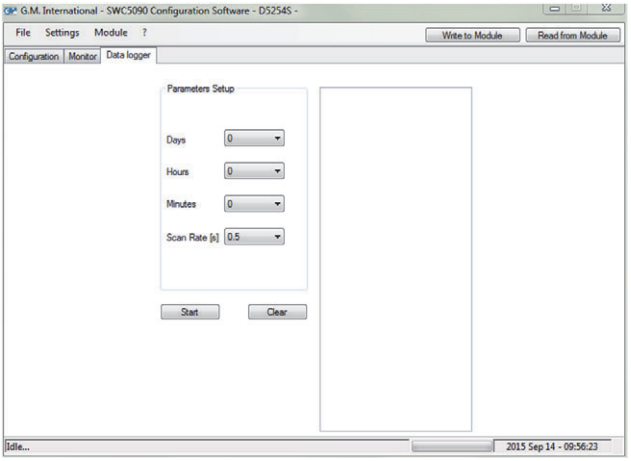
D5254S Input/Output screen



D5254S Alarm screen



D5254S Monitor screen



D5254S Data Logger screen

Supported ModBus Parameters:

Param. Address	Description	Notes	Type (15)
0	G.M. Factory Code	Identification Data	R
1	Instrument Code		
2	Option Code		
3	Hardware Release		
4	Software Release		
5 to 15	Reserved		
16	Modbus Address	Communication Data	R/W
17	Modbus Baudrate		
18	Modbus Format		
64	Measured Value (Low 16 bits) (1)	Input (Field) Data	R
65	Measured Value (High 16 bits) (1)		
66	Converted Value (Low 16 bits) (1)		
67	Converted Value (High 16 bits) (1)		
68	Input Fault (2)		
102	Input Downscale (Low 16 bits) (1)	Input (Field) Configuration	R/W
103	Input Downscale (High 16 bits) (1)		
104	Input Upscale (Low 16 bits) (1)		
105	Input Upscale (High 16 bits) (1)		
106	Input Type (3)		
107	Input Conversion Voltage (4)		
108	Input Fault Switch (5)		
109	Input Low Range Fault (Low 16 bits) (1)		
110	Input Low Range Fault (High 16 bits) (1)		
111	Input High Range Fault (Low 16 bits) (1)		
112	Input High Range Fault (High 16 bits) (1)		
160	Output Downscale (Low 16 bits) (6)	Output Configuration	R/W
161	Output Downscale (High 16 bits) (6)		
162	Output Upscale (Low 16 bits) (6)		
163	Output Upscale (High 16 bits) (6)		
164	Output Under Range (Low 16 bits) (6)		
165	Output Under Range (High 16 bits) (6)		
166	Output Over Range (Low 16 bits) (6)		
167	Output Over Range (High 16 bits) (6)		
168	Output Fault Current (Low 16 bits) (6)		
169	Output Fault Current (High 16 bits) (6)		
170	Output Fault Mask (6) (7)		
171	Output Source (8)		
240	Alarm 1 Configuration (9)	Alarm 1 Control	R/W
241	Alarm 1 Acknowledgement configuration (10)		
242	Alarm 1 Startup Lock		
243	Alarm 1 Fault Configuration (11)		
244	Alarm 1 Fault Mask (12)		
245	Contact Position in Case of Alarm 1 (13)		
246	Delay to Alarm 1 Issue (14)		
247	Delay to Alarm 1 Removal (14)		
248	Alarm 1 Low Threshold (Low 16 bits) (1)		
249	Alarm 1 Low Threshold (High 16 bits) (1)		
250	Alarm 1 Low Threshold Hysteresis (Low 16 bits) (1)		
251	Alarm 1 Low Threshold Hysteresis (High 16 bits) (1)		
252	Alarm 1 High Threshold (Low 16 bits) (1)		
253	Alarm 1 High Threshold (High 16 bits) (1)		
254	Alarm 1 High Threshold Hysteresis (Low 16 bits) (1)		
255	Alarm 1 High Threshold Hysteresis (High 16 bits) (1)		
256	Alarm 2 Configuration (9)	Alarm 2 Control	R/W
257	Alarm 2 Acknowledgement configuration (10)		
258	Alarm 2 Startup Lock		
259	Alarm 2 Fault Configuration (11)		
260	Alarm 2 Fault Mask (12)		
261	Contact Position in Case of Alarm 2 (13)		
262	Delay to Alarm 2 Issue (14)		
263	Delay to Alarm 2 Removal (14)		
264	Alarm 2 Low Threshold (Low 16 bits) (1)		
265	Alarm 2 Low Threshold (High 16 bits) (1)		
266	Alarm 2 Low Threshold Hysteresis (Low 16 bits) (1)		
267	Alarm 2 Low Threshold Hysteresis (High 16 bits) (1)		
268	Alarm 2 High Threshold (Low 16 bits) (1)		
269	Alarm 2 High Threshold (High 16 bits) (1)		
270	Alarm 2 High Threshold Hysteresis (Low 16 bits) (1)		
271	Alarm 2 High Threshold Hysteresis (High 16 bits) (1)		
464	EEPROM Write	Command	W
539	Output virtual value	Output Data	R
543	Alarm 1 Status	Alarm Data	R
546	Alarm 2 Status	Alarm Data	R

ModBus parameters details:

Param. Address	Description	Notes	Type (15)
548	Ch. 1 chars 0, 1	Tags	R/W
549	Ch. 1 chars 2, 3	Tags	R/W
550	Ch. 1 chars 4, 5	Tags	R/W
551	Ch. 1 chars 6, 7	Tags	R/W
552	Ch. 1 chars 8, 9	Tags	R/W
553	Ch. 1 chars 10, 11	Tags	R/W
554	Ch. 1 chars 12, 13	Tags	R/W
555	Ch. 1 chars 14, 15	Tags	R/W

Supported ModBus Baudrates

Index	Baudrate
0	4800
1	9600
2	19200
3	38400
4	57600
5	115200

Address 18: Supported Modbus Formats

High Byte								Low Byte							
Bit position															
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Endianness 32 bit Data (0 = Little; 1 = Big)
Termination resistance (1 = enabled)
Supported Modbus Parity:
0 8 data bit, no parity, 1 stop bit
1 8 data bit, even parity, 1 stop bit
2 8 data bit, odd parity, 1 stop bit

Address 464: EEPROM Write

High Byte								Low Byte							
Bit position															
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

1 Save Input/Output Configuration
2 Save Modbus configuration
8 Save Tags

(1) Expressed in 100 nA for input current
100 µV for Voltage (± 30 V)
1 µV for Voltage (± 1 V)
(2) 0 = no fault; 1 = Input out-of-range / burnout fault
(3) 0 = Current
1 = Voltage (± 30 V)
2 = Voltage (± 1 V)
(4) 0 = No conversion
1 = Square root
(5) 0 = Ignore input fault
1 = Report input out-of-range / burnout input fault
(6) Expressed in 100 µA
(7) 0 = Ignore input fault
1 = Report input out-of-range / burnout input fault force output to fault current
(8) 0 = Output Sink; 1 = Output Source
(9) 0 = None; 1 = Low Threshold; 2 = High Threshold;
3 = Window Thresholds; 4 = Fault Repeater
(10) 0 = None
1 = Acknowledgement active when input is energized
2 = Acknowledgement active when input is de-energized
(11) 0 = Ignore input fault
1 = Freeze alarm before fault issue
2 = Alarm on in case of input fault
3 = Alarm off in case of input fault
(12) 0 = Ignore input fault
1 = Out-of-range / burnout input fault force alarm to fault configuration
(13) 0 = Open; 1 = Closed
(14) Expressed in 100 ms
(15) Parameter Type:
R = read only,
W = write only,
R/W = read and write.